Semester-VI
Artificial Intelligence (IT-6003)

Course Code	IT-6003	Credits-4	L-3, T-1, P-0
Name of the Course	Artificial Intelligence		
Lectures to be Delivered	52 (1 Hr Each) (L=39, T=13 for each semester)		
Semester End Examination	Max Marks: 100	Min Pass Marks: 40	Maximum Time: 3 hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			Max Marks: 50

Instructions

1. **For Paper Setters:** The question paper will consist of five sections A, B, C, D and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 20% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each question will carry 20% of the total marks of the semester end examination for the course.
2. **For Candidates:** Candidates are required to attempt five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section –A

Scope of AI: Games, theorem Proving, Natural Language Processing, Vision and speech processing, Robotics, Expert system AI techniques search knowledge, abstraction, problem solving, State space search, Control strategies, depth first search, breadth first search, production system, problem characteristics, Decomposable, ignorable, recoverable, predictable.

Use of Heuristics: Hill climbing, Best first search, A * algorithm: Admissibility, AND/OR graph 0 AO *, constraint, satisfaction, crypto arithmetic, Waltz line labeling
Game playing, Minimax search, Alpha-Beta pruning.
Knowledge Representation: Predicate logic, well-formed formulas, quantifiers, prenex normal form skolemization, unification, modus pones, resolution refutation various strategies

Rule based system, Forward reasoning: Conflict resolution Backward reasoning: Use for no back track.

Structured knowledge representation.
Semantic net: Slots inheritance, frames – exceptions and default attached predicates; conceptual dependency form formalism, object oriented representation

Section B

A.I. programming language

PROLOG: Syntax, procedural and declarative meaning, Prolog unification mechanism, Anonymous variable, Lists, Use of fail, CUT, not.
LISP: Basic concepts, Eval function, Function and variable, scooping of LISP variable, iteration and recursion.

Section C

Headlong uncertainty: Probabilistic reasoning, Byes net, Dumpster Shafer theory: use of certainty factors Fuzzy logic, no monotonic reasoning, Dependencdirectedbackt, Truth maintenance systems.

Learning: Concept of learning, learning automation, the genetic algorithm, learning by induction, Neural Networks: Hop field Networks, perceptions learning algorithm, back propagation network, Boltzman Machine.

Section D

Planning: Components of planning system, Plan generation algorithm: Forward state propagation, backward state propagation, non-linear planning using constraint posting.

Expert System: Need & justification for expert system – Cognitive problems, Expert system architecture: Rule based system, Non-production system, knowledge acquisition, case studies: MYCIN, RI.

Natural language processing: syntactic analysis, top down and bottom up parsing, Augmented transition networks Semantic analysis case grammars.

Books: -

1. AI – E. Rich & K Knight Tata McGraw Hill (2nd edition)
2. Introduction to Expert system – D.W. Paterson, Prentice Hall of India (1992)
3. Introduction to expert system –Peter Jackson, Addison Wesley publishing company.
4. AI an engineering Approan –R.J Schalkoff, McGraw Hill international Edition
5. Principles of AI Nilsson Narosa publishing Narosa publishing house.
6. Programming in PROLOG – Clocksm 7 Mellish, Narosa Publishing House
7. Rule Based Expert System- M. Sasikumar, S, Ramani
8. Artificial Intelligence – P.H. Wisnston, 2nd edition, Addison Wesley 1884.